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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/649,659 | 08/28/2003 | Masataka Eida | 03500.016159.1 | 6936 |

5514 7590 12/19/2005

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EXAMINER

LEADER, WILLIAM T

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1742

DATE MAILED: 12/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/649,659

Applicant(s)

EIDA ET AL.

Examiner

William T. Leader

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,3,5-7,16,18,20,21,23-27 and 30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 2,3,5-7,16,18,20,21,23-27 and 30 is/are rejected.
- 7) ☒ Claim(s) 19 and 22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 10/067,220.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date: ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>8/28/2003</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 2 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Koyama et al (5,443,687).

4. The Koyama et al patent is directed to a method for manufacturing an ink jet head having an improved discharge surface. A F-C coupled water repellent film is formed. See the abstract. It is not apparent that the product of claim 2 differs from that disclosed by Koyama et al.

5. Claims 2, 3, 16 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kayama et al (5,443,687) in view of Kondo et al (5,160,415) or Watanabe et al (5,069,764).

6. The Koyama et al patent is interpreted and applied as above. Koyama et al disclose forming the F-C coupled water repellent film by placing a carbon surface in a fluoric plasma. See column 4, lines 7-26; column 5, lines 26-35.

7. Claims 2, 3, 16 and 30 differ from Kayama et al by reciting that the F-C ink repellent film is formed electrolytically by applying a voltage to the substrate while it is immersed in a molten salt of fluoride. The Kondo et al patent is directed to apparatus for electrolysis of a hydrogen fluoride-containing molten salt with a carbon electrode. Kondo et al teach that a reaction occurs between the carbon anode and the F_2 evolved at the anode. A film of graphite fluoride is formed. The film has an extremely low surface energy with decreased wettability. See column 2, lines 22-30.

8. The Watanabe et al patent similarly discloses that a film of graphite fluoride having an extremely low surface energy is formed on the carbon electrode due to the reaction between the evolved fluorine and the carbon electrode during the course of the electrolysis reaction. See column 1, lines 43-50.

9. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have formed a water repellent F-C layer by electrolysis in a molten fluoride-containing bath to form a water repellent layer on an ink jet head as shown by Kayama et al because Kondo et al and Watanabe et al teach that electrolysis is an effective method for forming such a film with extremely low surface energy.

10. Claims 5, 6, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kayama et al (5,443,687) in view of Kondo et al (5,160,415) or Watanabe et al (5,069,764) as applied to claims 2, 3, 16 and 30 above, and further in view of Liu et al (6,433,303) and Hino et al (6,168,910).

11. Claims 5 and 23 recite forming a through-hole by projecting a femtosecond laser onto the liquid-repellent member. Kayama et al discloses the formation of a through-hole using an excimer laser or the like (column 6, lines 6-8). Kayama et al does not specifically disclose the use of a femtolaser. The Liu et al patent is directed to a method using a laser to make an array of microcavity holes. Liu et al teach that an excimer laser or a femtosecond laser can be used (column 2, lines 33-44). Claims 6 and 24 recite that gas including oxygen is provided in the vicinity of the liquid-repellent member on which the femtosecond laser is projected. The Hino et al patent is directed a method for removing residue and discloses that removal of residue and debris from laser beam irradiation it is preferable that oxygen gas be blown onto the irradiation area (column 8, lines 23-25). It would have been obvious at the time the invention was made to have utilized a femtosecond laser in the process of Kayama et al because it is a recognized equivalent as shown by Liu et al, and to have provided oxygen in the region of irradiation because debris and residue are more effectively removed as taught by Hino et al.

12. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kayama et al (5,443,687) in view of Kondo et al (5,160,415) or Watanabe et al (5,069,764) as applied to claims 2, 3, 16 and 30 above, and further in view of Fujii et al (6,371,598).

13. Claim 7 and 20 recite the step of dividing the substrate with the liquid-repellent film to obtain a plurality of members. The Fujii et al patent is directed to an ink jet head and discloses that multiple heads may be formed on a single substrate and subsequently divided. This manufacturing method enables the batch production of plural ink jet heads and makes it possible

to easily manufacture head at low cost (column 16, lines 21-29). It would have been obvious to have formed a plurality of heads on the substrate of Kayama et al and subsequently divided them as taught by Fujii et al because manufacturing cost would have been lowered

14. Claims 18 and 21 rejected under 35 U.S.C. 103(a) as being unpatentable over Kayama et al (5,443,687) in view of Kondo et al (5,160,415) or Watanabe et al (5,069,764) in view of Fujii et al as applied to claims 7 and 20 above, and further in view of Utsumi et al (4,766,671).

15. Claims 18 and 21 recite the step of polishing a surface of the substrate. The Utsumi et al patent is directed to method manufacturing an electronic device such as an ink jet head. Utsumi et al teach the step of polishing the nozzle end face to achieve stable ink drop injection (column 13, lines 36-38). It would have been obvious at the time the invention was made to have polished the substrate of Kayama et al because properties such as stable ink drop injection would have been improved as taught by Utsumi et al.

16. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kayama et al (5,443,687) in view of Kondo et al (5,160,415) or Watanabe et al (5,069,764) as applied to claims 2, 3, 16 and 30 above, and further in view of Usui et al (6,540,322).

17. Claims 25-27 recite an air suction device for suctioning ink. Kayama et al disclose providing a suction means (column 8, lines 56-68). The Usui et al patent is directed to an ink jet head. A suction hole is provided. See the abstract. . It would have been obvious at the time the

invention was made to have provided a suction hole as the suction means of Kayama et al because Usui et al show this to be an effective manner for providing suction.

Double Patenting

18. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

19. Claim 27 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,685,301. Although the conflicting claims are not identical, they are not patentably distinct from each other because instant claim 27 is broader than and encompasses claim 1 of the patent. Claim 1 of the patent requires the suction pressure for the air to be smaller than meniscus maintaining pressure of the ink jet discharge element. Instant claim 27 does not include this limitation.


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20. Claims 19 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record does not suggest using the polishing table to hold the substrate during formation of the water repellant layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


William Leader
December 7, 2005


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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700